

soap paste, drawn from a soap-pan, is fed into the hopper of a mill at one end of the machine with two or three cylinders and receivers, one or two millings, according to the number of cylinders, and at last falls in extremely thin shavings into the chamber which forms the real drying machine; the shavings are received on endless linen bands which are so arranged that they are one over the other and occupy the full width of the chamber. These linen bands are put into motion and are arranged so that the soap falls at one end on the topmost band of the machine, and is carried along to the other end, whence it drops on the next linen band; this in turn passes it to the third one, and so on until it comes to the last one, or the lowest, which carries the soap out of the apparatus. In the lower part of the drying machine is a hot-air stove which is preferably heated by steam. The stove is furnished with apparatus for drawing the heated air at a temperature of about 60° C. through the chamber. This hot air meets the soap shavings as they travel on the bands, gets saturated with the moisture they contain, and then escapes through the top of the apparatus by the ventilator, while the soap, dried to the desired extent, passes out at the bottom of the drying stove. This stove which dries the soap paste in an automatic and continuous manner, securing a good profit to the soap-maker who uses it, has an area about 45 feet square and can be manipulated by one workman and one assistant; it gives a yield of more than one ton of dried soap. The motive power required is about two horse power, and the expense for heating is small.

Making Coloured Soaps.—All colouring matters which are proof against heat—mineral colours among others—can be mixed with the liquid soap when it comes out of the boiler, but when soft and delicate shades of fine soaps are wanted, shades that can only be got from delicate colours, it is better

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Another feature which makes it needful to have a soluble soap is that it is necessary thoroughly to wash the soap out of the silk after it has been boiled in it.

For a silk soap, olive oil is the best. Ground-nut oil may also be used with good results; a little bleached palm oil may be added. The soap ought to be well made, the principal point being to leave little or no fat.

Another way in which the soap is employed in the silk industry is in dyeing, much of this being done in a bath of soap, a method which seems to the writer to be a relic from other days, and might be abandoned. There is no peculiarity about the soap which is used for this purpose; a good olive oil soap works best—the only point is to avoid the presence of free fat, and have a good soluble soap.

D. SPECIAL SOAPS.

We may now turn our attention to the production of a class of soaps made for special purposes, or, perhaps, in some cases supposed to be made for some special purpose. These soaps are rather numerous and are sold under a variety of fancy names, and often at equally fancy prices which leave a good margin of profit for the maker.

Medicated Soaps.—A large number of soaps are made which are supposed to be of medicinal value. That some of them are there is no doubt, but whether others have any such value at all is rather an open question. The process of manufacture of these soaps is very simple. First of all there is made an ordinary soap stock in the usual way, and into this is worked by means of the crutcher, or by the milling process (the latter plan, perhaps, giving the best results) the special substance which gives value to the soap. Makers will, of course, differ in the character of the soap stock which they will use for what is normally the same

soap, but this is a small point which is of very little moment.

Carbolic Soaps.—Of all the various kinds of medicated soaps, those containing carbolic acid, or, as the chemist calls it, phenol, are perhaps the most important, for they are made in large quantities and are used for common household purposes. For making carbolic soaps almost any good soap stock may be used, but this is usually varied according to the quality or grade of the soap. Thus, the lowest grades of carbolic soaps are made from the nigras of pale soaps mixed with fresh soap stock. The best grades of these soaps are made from good pale soaps of tallow, bleached palm oil, and rosin. As carbolic acid has a slight acid reaction, it is a good plan to leave the soap stock slightly alkaline, for, if quite neutral, the acid may cut the soap while being mixed. The usual quantity of carbolic acid is 10 per cent. Occasionally soaps are made containing 5 per cent. This is the minimum quantity which should be added, or the medicinal value of the soap will be reduced to nil.

For pale carbolic soaps the best crystal acid should be used. Before adding to the soap this may be mixed with a small quantity of water to make it liquid. For the commoner class of carbolic soaps, which usually are of a dark brown colour, the crude carbolic acid may be used. The process is simple. The soap stock is made in the ordinary way, and, after being run off and fitted if required, the carbolic acid is crutched in in the crutcher, adding it little by little. After the crutching the soap is framed and allowed to set, after which it may be cut up into bars and stamped in the usual way.

Naphthol Soap.—Another disinfectant soap which is sometimes made is naphthol soap. This is made by crutching 10 lb. of naphthol into 1 cwt. of a good soap and finishing as usual. In place of naphthol, naphthalene may be used.